

List of Plants

C MALIC-ACID

Chemid

MALICACID

Dosage

LD₅₀=1,600 (orl rat)

*Unless otherwise noted all references are to Duke, James A. 1992. Handbook of phytochemical constituents of GRAS herbs and other economic plants. Boca Raton, FL. CRC Press.

Plant	Plant Part	Low PPM	High PPM	StdDev	*Reference
Acacia nilotica	Plant	--	--		*
Aconitum napellus	Plant	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Allium schoenoprasum	Leaf	--	--		*
Allium cepa	Leaf	--	--		Soldatenkov, S. V., Mazurova, T. A., Rantleev, A. N. 1960. Organic Acids of Onion and Spinach. Trudy Petergof Biol. Inst., Leningrad Gosudarst Univ Im AA Zhdanova, 18: 55-61.
Allium cepa	Bulb	--	--		Soldatenkov, S. V., Mazurova, T. A., Rantleev, A. N. 1960. Organic Acids of Onion and Spinach. Trudy Petergof Biol. Inst., Leningrad Gosudarst Univ Im AA Zhdanova, 18: 55-61.
Alocasia macrorrhiza	Plant	--	--		*
Ananas comosus	Fruit	1000.0	4700.0	-0.65	*
Angelica archangelica	Plant	--	--		*
Angelica archangelica	Root	--	--		*
Annona squamosa	Plant	--	--		*
Annona muricata	Plant	--	--		*
Apium graveolens	Pt	--	--		*
Apium graveolens	Shoot	--	--		*
Apium graveolens	Root	--	--		*
Arctostaphylos uva-ursi	Leaf	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Arnica montana	Flower	--	--		*
Avena sativa	Petiole	--	--		*
Avena sativa	Hull Husk	--	--		*
Averrhoa carambola	Fruit	--	12100.0	-0.16	Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.
Berberis vulgaris	Fruit	--	--		Jim Duke's personal files.
Berberis vulgaris	Plant	--	--		*
Borago officinalis	Plant	--	--		*
Borago officinalis	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Brassica oleracea var. botrytis l.	Plant	--	--		*

<i>Brassica oleracea</i> var. <i>capitata</i> L.	Lear	--	--		Jim Duke's personal files.
<i>Brassica oleracea</i> var. <i>botrytis</i> L.	Flower	--	--		*
<i>Brassica oleracea</i> var. <i>italica</i>	Plant	--	--		Jim Duke's personal files.
<i>Brassica oleracea</i>	Stem	--	--		*
<i>Brassica oleracea</i> var. <i>gemmifera</i>	Leaf	--	--		*
<i>Brassica oleracea</i> var. <i>sabellica</i> L.	Leaf	--	--		*
<i>Calendula officinalis</i>	Flower	--	6400.0	-1.0	*
<i>Camellia sinensis</i>	Leaf	--	--		*
<i>Capsella bursa-pastoris</i>	Plant	--	--		*
<i>Carica papaya</i>	Latex Exudate	--	4400.0		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
<i>Carica papaya</i>	Fruit	3150.0	23333.0	0.57	*
<i>Cephaelis ipecacuanha</i>	Plant	--	--		*
<i>Chaenomeles lagenaria</i>	Fruit	--	--		*
<i>Chelidonium majus</i>	Plant	--	--		*
<i>Chenopodium ambrosioides</i>	Fruit	--	--		*
<i>Cichorium intybus</i>	Plant	--	--		*
<i>Citrus sinensis</i>	Fruit	600.0	2000.0	-0.82	*
<i>Citrus reticulata</i>	Fruit	1800.0	2100.0	-0.82	*
<i>Citrus aurantium</i>	Plant	--	--		*
<i>Citrus mitis</i>	Fruit Juice	--	2000.0		*
<i>Citrus paradisi</i>	Fruit	400.0	600.0	-0.91	*
<i>Citrus aurantiifolia</i>	Fruit	--	2000.0	-0.82	*
<i>Cocos nucifera</i>	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
<i>Convallaria majalis</i>	Plant	--	--		*
<i>Cornus officinalis</i>	Fruit	--	--		*
<i>Cryptostegia grandifolia</i>	Latex Exudate	--	--		*
<i>Cydonia oblonga</i>	Seed	--	--		*
<i>Daphne mezereum</i>	Bark	--	--		*
<i>Datura stramonium</i>	Plant	--	2120.0	-0.62	*
<i>Daucus carota</i>	Root	--	--		*
<i>Elytrigia repens</i>	Rhizome	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
<i>Equisetum arvense</i>	Plant	--	--		*
<i>Eriobotrya</i>	Leaf	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)

<i>Euonymus atropurpureus</i>	Plant	--	--		*
<i>Euphorbia tirucalli</i>	Plant	--	--		*
<i>Fagopyrum esculentum</i>	Leaf	--	15100.0	0.61	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
<i>Ficus carica</i>	Fruit Juice	--	--		Shiraishi, S. C., Kawakami, K., Widodo, S. E., Shiraishi, M., Kitazaki, M. 1996. Organic acid profiles in the juice of fig fruits. Journal of the Faculty of Agriculture Kyushu University, 41(1-2): 29-33.
<i>Ficus carica</i>	Leaf	--	23400.0	1.66	Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
<i>Ficus carica</i>	Fruit	--	30200.0	1.01	*
<i>Foeniculum vulgare</i>	Fruit	--	--		*
<i>Foeniculum vulgare</i>	Seed	--	--		Rizk, A.F.M., The Phytochemistry of the Flora of Qatar, Scientific and Applied Research Centre, University of Qatar, Kingprint, Richmond, UK, 1986.
<i>Fragaria spp</i>	Fruit	3500.0	8000.0	-0.43	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
<i>Frangula purshiana</i>	Plant	--	--		*
<i>Galium odoratum</i>	Plant	--	--		*
<i>Genipa americana</i>	Fruit	--	6300.0	-0.54	*
<i>Ginkgo biloba</i>	Pollen Or Spore	--	--		Jim Duke's personal files.
<i>Glycine max</i>	Seed	700.0	1000.0		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
<i>Glycyrrhiza glabra</i>	Root	--	--		=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
<i>Hedera helix</i>	Plant	--	--		*
<i>Helianthus annuus</i>	Leaf	--	--		Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
<i>Hibiscus sabdariffa</i>	Leaf	--	12500.0	0.28	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
<i>Hibiscus sabdariffa</i>	Flower	6233.0	56667.0	1.0	*
<i>Hibiscus sabdariffa</i>	Stem	--	6000.0		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
<i>Hippophae rhamnoides</i>	Fruit	15000.0	29000.0	0.94	*
<i>Juglans regia</i>	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
<i>Kalanchoe daigremontiana</i>	Plant	--	--		*
<i>Kalanchoe pinnata</i>	Leaf	--	--		*
<i>Lactuca sativa</i>	Leaf	--	600.0	-1.22	*
<i>Lactuca virosa</i>	Plant	--	--		*
<i>Lactuca scariola</i>	Latex Exudate	--	--		*
<i>Ledum palustre</i>	Plant	--	--		*
<i>Leonurus cardiaca</i>	Plant	--	--		*
<i>Lepidium meyenii</i>	Root	--	--		*
<i>Linum usitatissimum</i>	Seed	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
<i>Lupinus albus</i>	Seed	--	--		*
<i>Lycopersicon esculentum</i>	Fruit	--	--		*
<i>Mangifera indica</i>	Fruit	6700.0	36600.0	1.43	*

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Medicago sativa	Plant	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Morus alba	Leaf	--	--		*
Musa x paradisiaca	Fruit	530.0	3730.0	-0.71	Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
Myrciaria dubia	Fruit	--	--		Jim Duke's personal files.
Myrtus communis	Fruit	--	--		*
Nicotiana tabacum	Leaf	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Opuntia ficus-indica	Fruit	180.0	1700.0	-0.84	*
Opuntia ficus-indica	Plant	--	--		*
Opuntia ficus-indica	Leaf	--	950.0	-1.18	*
Panax quinquefolius	Plant	--	--		*
Panax ginseng	Root	--	--		*
Papaver somniferum	Latex Exudate	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Passiflora edulis	Fruit	1200.0	3800.0	-0.7	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Petroselinum crispum	Root	--	--		*
Physalis peruviana	Plant	--	--		*
Physalis ixocarpa	Fruit	116.0	1500.0	-0.85	*
Pimenta dioica	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Piscidia piscipula	Plant	--	--		*
Pisum sativum	Seed	--	--		*
Polygonum hydropiper	Plant	--	--		*
Polygonum hydropiperoides	Plant	--	--		*
Polypodium vulgare	Root	--	--		*
Populus nigra	Plant	--	--		*
Portulaca oleracea	Plant	--	5100.0	1.41	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Prunus cerasus	Fruit Juice	--	--		*
Prunus armeniaca	Fruit	7000.0	22000.0	0.48	*
Prunus domestica	Fruit	--	15000.0	0.02	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Punica granatum	Fruit Juice	--	--		*
Punica granatum	Fruit	--	--		*
Pyrus communis	Fruit	--	--		*
Quassia amara	Root	--	--		*
Quisqualis indica	Fruit	--	--		*
Rheum rhabarbarum	Pt	--	--		*
Ribes uva-crispa	Fruit	--	7300.0	-0.48	*
Ribes rubrum	Fruit	--	2600.0	-0.78	*
Rosa gallica	Flower	--	--		*

ROSA CECERIFOLIA	FLOWER					
Rosa spp	Fruit	--	--		*	
Rosa laevigata	Fruit	--	--		*	
Rosa canina	Fruit	15000.0	62200.0	3.1	*	
Rubus chingii	Fruit	--	--		*	
Rubus idaeus	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.	
Rubus fruticosus	Leaf	--	--		*	
Ruta graveolens	Leaf	--	--		*	
Salvia officinalis	Plant	--	--		*	
Sambucus nigra	Fruit	1200.0	19000.0	0.29	*	
Sanguinaria canadensis	Plant	--	--		*	
Sarcostemma acidum	Plant	--	--		*	
Schisandra chinensis	Plant	--	--		*	
Schisandra chinensis	Fruit	5000.0	33333.0	1.22	*	
Sclerocarya caffra	Fruit	--	--		*	
Solanum tuberosum	Tuber	--	1120.0		*	
Sophora pachycarpa	Leaf	--	--		*	
Sorbus aucubaria	Fruit	19000.0	39000.0	1.59	*	
Spinacia oleracea	Leaf	--	4300.0	-0.75	Soldatenkov, S. V., Mazurova, T. A., Ranteleev, A. N. 1960. Organic Acids of Onion and Spinach. Trudy Petergof Biol. Inst., Leningrad Gosudarst Univ Im AA Zhdanova, 18: 55-61.	
Stevia rebaudiana	Plant	--	1880.0	-0.79	Kinghorn, A. D. (Ed.) 2002. Medicinal and Aromatic Plants - Industrial Profiles. Stevia. The genus Stevia. Taylor & Francis. New York, NY. 211 pp.	
Tamarindus indica	Leaf	--	15000.0	0.6	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.	
Tamarindus indica	Fruit	--	10000.0	-0.3	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.	
Tussilago farfara	Flower	--	--		*	
Urtica dioica	Plant	--	--		*	
Vaccinium myrtillus	Leaf	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.	
Vaccinium macrocarpon	Fruit	--	--		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.	
Vaccinium vitis-idaea	Fruit	--	--		*	
Valeriana officinalis	Root	--	--		*	
Valeriana jatamansi	Root	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.	
Vanilla planifolia	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.	
Viburnum opulus	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.	
Viburnum prunifolium	Root Bark	--	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.	
Vicia faba	Fruit	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.	
Viola odorata	Flower	--	--		*	
Vitis vinifera	Plant	--	--		*	
Vitis vinifera	Fruit	1500.0	2000.0	-0.82	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.	
Zea mays	Plant	--	--		*	
Zea mays	Silk	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley &	

